Using an iPhone or iPad for Tonal Activities in Teaching Mandarin Chinese

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Abstract

Tonal variation is a critical component of spoken Mandarin Chinese, but is relatively rare in Western languages such as English. Native speakers of Western languages who seek to learn Mandarin Chinese often find it particularly difficult to hear and reproduce the tonal variations that are required for fluency in the language. Auditory exercises focusing on detecting tonal variation in sound files can help such learners improve their ability to accurately perceive these variations over time. Recent developments in consumer technology, such as inexpensive smartphones and tablets, have provided tools that ease the process of creating and distributing such exercises. This article will describe the essence of the content to be employed in such learning activities and provide details of the process used to record and distribute them via smartphone.

Keywords: Mandarin Chinese, smartphone, tonal variation, curriculum, tablet

1. Introduction

Mandarin Chinese is a tonal language, which means that variation in tone is an essential component in determining the meaning of a word. Many written Chinese characters have the same sound, and variation in tone is the only means of determining the intended meaning when the characters are spoken aloud. English is not a tonal language; English speakers often have difficulty in accurately hearing tonal variations, as well as reproducing them when speaking.

The nearest equivalent for English speakers appears to be learning to hear and reproduce tonal variations when performing music. There is a long history of using recordings (both heard and created by the learner) to assist novices in hearing and reproducing tonal variations in music; for a digital example, see Kuzmich (2012). As it happens, English speakers experienced in hearing tonal variations in music do seem to be more skilled at detecting tonal variation in Chinese; see for example, Deutsch, Henthorn, & Dolson (2004) and Creel, Weng, Fu, Heyman, & Lee (2017). It is clear that practice in hearing tonal variation can help English speakers improve this ability. There is also a body of research on the use of audio voice files to provide spoken feedback to students, and Sull and Cavanaugh (2014) specifically mention the role of spoken tone in helping students to more accurately interpret the intended meaning of instructor feedback, supporting the assumption that English speakers can interpret spoken tonal variations under at least some circumstances.

Intensive practice focused on accurately detecting (and later reproducing) tonal variation is an important aspect of teaching Chinese as a second language to native English speakers. Of course, live practice in real time with a human Chinese speaker is commonly employed for this purpose, but for practice outside of the classroom or in purely distance education settings alternatives are necessary. Karch (2014) observes that in the current era both teachers and students have come to view the use of smartphones as instructional tools to be an area with obvious potential. Modern smartphones and tablets, often readily available to teachers and students alike, are ideal for creating and distributing brief audio exercises that provide practice in hearing tonal variations in spoken Chinese. This article will describe one specific technique using these commonly available technologies and provide detailed procedures for its use with such brief audio exercises.

2. Linguistic Content

Spoken Mandarin Chinese has four main tones:

• First tone: tone remains level throughout, and is at a moderately high pitch

• Second tone: tone starts at a lower pitch and rises, ending on slightly higher pitch

• Third tone: tone starts at a neutral pitch, dips to a lower pitch, then ends on a higher pitch

• Fourth tone: tone starts at a moderately high pitch, then moves downward rapidly to a lower pitch

Below are a few simple examples of Chinese characters whose meaning is distinguishable only by tone (see Table 1). Diacritical marks are provided for English versions in this chart to indicate appropriate tones. Simple examples of this sort can form the basis of brief audio exercises that provide practice for English speakers in accurately hearing, recognizing, and reproducing the appropriate tones.

Table 1. Examples of Chinese Characters Whose Meaning is Distinguishable Only by Tone

English Pronunciation Without Tonal Variation	Tone 1		Tone 2		Tone 3		Tone 4	
	Mā		Má		Mǎ		Mà	
Mah	Simplified	Traditional	Simplified	Traditional	Simplified	Traditional	Simplified	Traditional
	妈	媽	麻	麻	马	馬	骂	罵
	Mother		Hemp		Horse		Scold	
	Bā		Bá		Bǎ		Bà	
Bah	Simplified	Traditional	Simplified	Traditional	Simplified	Traditional	Simplified	Traditional
	八	八	拔	拔	把	把	爸	爸
	Eight		Pull		Put		Dad	
	Guō		Guó		Guǒ		Guò	
Gwo	Simplified	Traditional	Simplified	Traditional	Simplified	Traditional	Simplified	Traditional
	锅	鍋	国	國	果	果	过	過
	Pot		Nation		Fruit		Cross	
	Jī		Jí		Jǐ		Jì	
Jee	Simplified	Traditional	Simplified	Traditional	Simplified	Traditional	Simplified	Traditional
	鸡	雞	级	級	几	幾	寄	寄
	Chicken		Grade		A few		Send	

3. Technology

Smartphones and tablets frequently contain free apps (applications) that lend themselves readily to the creation and playback of audio files. This article will focus on using the "Voice Memos" app to create and distribute sample tonal variation exercise files. "Voice Memos" is an application intended to be used for the making of audio recordings of brief memoranda. It is distributed by Apple Computer as part of the basic iOS set of applications for iPhones and iPads, and can also be found on Apple's App store for free. With the most recent version of Apple's computer operating system (Mojave), Voice Memos has also become available for Macintosh laptop and desktop computers. This article describes the process of using the Voice Memos app on an iPhone or iPad to create audio files containing tonal listening exercises for students based on figure 1 (above). Voice Memos is a very simple single-purpose app, but it does provide a number of different ways in which the sound files it creates can be stored and distributed. We will briefly review the major options in this area and address their strengths and weaknesses with regard to our tonal variation exercises.

4. Procedure

We will create a series of four short audio files. Each will consist of four Chinese characters whose meaning can be distinguished only by their tonal variation (note that our examples will be very basic, and that in practice additional, more complex content would be used over time). Prior to this exercise, students will have been introduced to the meaning of each character.

Each audio file will contain four Chinese characters drawn from a row in figure 1 (above). For example, the first audio file will consist of these four spoken words: 妈/媽,麻/麻,马/馬, 骂/罵. A student correctly completing the portion of the worksheet for these four characters would write mother, hemp, horse, scold.

The process begins with the instructor's iPhone or iPad. Working in a quiet area, she or he launches the Voice Memos app. The initial screen displays a list of any existing Voice Memo files with their date of creation and length in seconds, plus a large red button at the bottom of the screen. The instructor presses the red button once; immediately, the screen changes to display the name of the file being created ("New Recording", followed by a number), a timer reading in hundredths of a second, an amplitude graph of the sound being recorded, and another large red button. Speaking slowly and clearly, she or he pronounces the four words in the file (in our first example, 妈/媽,麻/麻,马/馬,骂/罵)then presses the red button a second time. The screen returns to the previous display, consisting of a list of Voice Memo files with the newly created file highlighted. The total time involved is very short – this file will almost certainly be less than ten seconds long. At this point one can choose to delete the file or play it back for review – or one can select the ellipses (…) from the menu, which provides the additional options of edit recording, duplicate, or share the recording (officially, this screen is known as the iOS "share sheet").

For purposes of this exercise, we will ignore the first two options (edit and duplicate), and focus on the options available for sharing the file with students. Background information: the files themselves are compressed and of relatively low fidelity, which helps minimize file size. A rough rule of thumb is that these files occupy about 10 kilobytes per second of recorded sound. This makes them small enough to share or store in a variety of ways (AirDrop, text message, email, etc.) without violating any limits on the size of files to be shared or stored. The files themselves are in the .m4a format. This is a common format for audio files, and can be readily played back on a wide variety of hardware and software.

Choosing the ellipses and the share option actually brings one to a choice between saving the file just created for later use, or distributing it immediately via one of several modalities. If one chooses the "save to files" option, one is offered the choice of either saving directly on the device being used to create the Voice Memos file, or saving to any of the "cloud" storage locations that have been previously activated using the "Files" app on the device. Common examples would include Google Drive, Dropbox, OneDrive, and iCloud drive. Saving to the device itself is actually a somewhat misleading option; iPhones and iPads have limited options for creating local file storage folders, and the Voice Memos app does not create a file storage folder for its own files, so it is difficult to store these files on the device itself and keep them well-organized. In practice, our recommendation is to choose a favorite cloud

storage location (the authors are fond of Google Drive), create a "Voice Memos" folder there, and store all of these audio files in that location. It's a good idea to rename the file at this point, since the default "new recording #" filenames quickly become indistinguishable; one can rename the file by tapping the filename on the main Voice Memos screen, and typing in a new filename. For purposes of our example, the previous "new recording 1" will become "Ma".

5. Distribution

Once one has stored the file for safekeeping and possible future editing, the next step is to distribute the file to students. If the instructor is using a shared storage location in the cloud that is also accessible to students in the class, one could save the file to this location as a means of distribution. There are a number of ways that the file can be actively "sent out" to students, each with its own strengths and weaknesses. The three most common are AirDrop, text message (SMS), and email. All three are described below. In each case we will take as our starting point the iOS Share Sheet accessed from the Voice Memos file being distributed.

5.1 AirDrop

AirDrop is a proprietary Apple system for distributing files to other Apple devices in close proximity via a wireless connection. This is probably the least likely of the three for a teacher to use in this setting, since it requires that the file be shared with the students while they are still in the classroom. In order for this to work, both wi-fi and Bluetooth must be enabled on all the devices involved, and everyone must be within a 30 foot radius. All of the students' devices must be listed in the instructor's contact list (or the instructor's phone must be configured for AirDrop to be discoverable by "anyone".) Provided these requirements are met, the instructor could distribute the file to the students by choosing the AirDrop icon from the iOS Share Sheet and tapping the icons for each of her or his students. However, it is difficult to make the case for using this method since the most likely use of this exercise is for homework. If conducting the tonal variation exercise in class, it would be easier simply to have the instructor speak the examples aloud in person. Much more likely are the options of using either text messaging or email to distribute the files.

5.2 Text Messaging

An instructor's choice of text messaging (SMS) or email distribution is likely to be determined by whether or not she or he normally communicates with this group of students via text messaging or email. Especially with younger students teacher-student communication via text messaging is less common. If one chooses the SMS route, the instructor should be sure to set up an address list containing all of the students' devices before sending out the audio file. This can be done from an iPhone or iPad using a free app known as "groups", or by using a Mac laptop or desktop to log into the instructor's iCloud account and creating a "group contact". Once this has been done, the instructor can simply choose the "message" icon from the iOS share sheet, type the name of the group contact, and hit the send button. The audio file will be sent as an attachment to a text message to everyone in the group

contact list. When a student receives the message, tapping on the attachment icon will cause the recording to play using whatever app has been configured on the student's device to play .mp4 files (which is frequently the same app used to play music on the device). Note that if the device is brand-new, it is possible that no app has been configured yet for audio files. If this is the case, the student will be unable to hear the contents of the file.

5.3 Email

Perhaps the most common distribution mechanism is that of email, because email is often used for a variety of communications between instructor and students. Note that in order for this method to work, both the instructor's device and the students' devices must be configured with active email accounts. In order to make the most efficient use of this mechanism, the instructor should first create a group contact in iCloud (as we suggested for distribution by SMS, above). This will make it possible to select a single recipient (the group contact) for the email and have the audio file go to all students in the class. The instructor views the Voice Memos file, selects the iOS Share Sheet, chooses "mail", types in the name of the group contact representing the class, and hits "send". The audio file arrives as an attachment to an email message. The default subject of the email message is the filename of the audio file, and the default message contains no text. When the student receives the email, tapping on the attachment icon will cause the recording to play using whatever app has been configured on the student's device to play .mp4 files.

5.4 Results

To recap: regardless of whether the instructor has chosen to distribute the audio files to the class via AirDrop, SMS, email, or some other mechanism, the end result is that the student has received four audio files and instructions to complete the listening activity. The files themselves may be received and played on a smartphone, tablet, or computer. The instructions to the students are as follows: "You will receive four short audio files, each of which contains four spoken Chinese characters to which you have already been introduced. You have viewed each Chinese character, heard it pronounced correctly, and seen the corresponding meaning in English. The attribute that distinguishes the meaning of the four characters in each file is their tonal variation, so you must listen carefully in each case. You will be writing down the English meaning of each of the four characters in each file. Label the first section of your document "audio file one", and number from one to four. Label and number the second, third, and fourth portions your document in a similar fashion. As you listen to each audio file, write down the correct English meaning of each Chinese character (word) that hear next to the appropriate number. When you have listened to all four files and written down the meaning of their contents save your document and return it to your teacher." [Methodologies will vary from class to class; some teachers will prefer submission via email or text message, and others will prefer a printout.]

6. Conclusion

Students who are not native speakers of Mandarin Chinese often find it difficult to accurately

detect the tonal variations that are crucial to accurately using the spoken form of the language. For this reason, learning activities focused on developing students' ability to discern tonal variation in spoken Chinese are an important part of mastering the language. Recent developments in consumer technology have provided tools such as Apple's Voice Memos application that simplify the process of creating and distributing such learning activities. The procedures described in this article can be used to develop and employ increasingly sophisticated auditory learning exercises focused on developing students ability to detect tonal variations in spoken Chinese.

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